

CLAIMS

1. A fuel tank (101-105) for a fuel cell, the fuel tank accommodating a liquid fuel (109) supplied to a fuel cell main body (201-205), and being detachable with respect to
5 said fuel cell main body, the fuel tank comprising:

a fuel injecting portion (130) configured to be engaged with a fuel supply portion (214, 215) included in said fuel cell main body and inject said liquid fuel accommodated in said fuel tank of the fuel cell; and

10 a flow path opening and closing member (131, 160, 139, 180) configured to be provided in said fuel injecting portion, allow said liquid fuel to pass to said fuel supply portion from said fuel injecting portion after a joint between said fuel supply portion and said fuel injecting
15 portion in connection with a connection of said fuel tank for the fuel cell to said fuel cell main body, and shut off the passage of said liquid fuel to said fuel supply portion from said fuel injecting portion before a disconnection between said fuel supply portion and said fuel injecting
20 portion in connection with a disconnection of said fuel tank for the fuel cell from said fuel cell main body.

2. The fuel tank for the fuel cell according to claim 1, wherein said flow path opening and closing member is
25 constituted by at least one of a fuel valve (131, 160, 180)

and a closing valve (139) provided in a flow path of said liquid fuel.

3. The fuel tank for the fuel cell according to claim 2,
5 wherein said fuel valve has a handle (132, 1621) configured to open and close a liquid fuel flow path in said fuel valve by a valve opening and closing member (213, 216, 250, 260) provided in said fuel cell main body, in accordance with an attachment and detachment between said fuel cell
10 main body and said fuel tank for the fuel cell.

4. The fuel tank for the fuel cell according to claim 3, further comprising a handle operating mechanism (150, 155) provided in said fuel tank for the fuel cell at a position
15 capable of operating said handle,

wherein said handle operating mechanism has a handle operating member (151, 1551) configured to be operated by said valve opening and closing member (250) in accordance with the attachment and detachment between said fuel cell
20 main body and said fuel tank for the fuel cell, bring into contact with said handle, and open and close said liquid fuel flow path; and an improper operation preventing member (152) configured to allow said handle operating member to move only at a time of connecting the fuel tank for the
25 fuel cell complying with said fuel cell main body to said

fuel cell main body.

5. The fuel tank for the fuel cell according to claim 3,
wherein said fuel valve has a member (1621) for rotation
5 corresponding to said handle and engaging with said valve
opening and closing member; and an engaging portion (161)
configured to rotate said valve opening and closing member
engaging with said member for rotation in accordance with
the attachment and detachment between said fuel cell main
10 body and said fuel tank for the fuel cell.

6. The fuel tank for the fuel cell according to claim 1,
further comprising a casing (110) provided with a concave
portion (111) accommodating said fuel injecting portion and
15 said flow path opening and closing member,

wherein said casing has a shutter (140) configured to
be provided in an opening portion (111a) of said concave
portion and open and close said concave portion at a time
of attaching and detaching said fuel cell main body and
20 said fuel tank for the fuel cell.

7. The fuel tank for the fuel cell according to claim 2,
wherein in a case that said flow path opening and closing
member has both of said fuel valve and said closing valve,
25 said fuel valve opens said flow path after said closing

valve opens said flow path at a time of supplying said liquid fuel, and shuts off said flow path before said closing valve at a time when said fuel supply portion and said fuel injecting portion are disconnected.

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8. The fuel tank for the fuel cell according to claim 1, further comprising a tank portion (120) configured to be connected to said fuel injecting portion, accommodate said liquid fuel and be made of a material which is deformable in accordance with a reduction of the contents; a casing (110) configured to accommodate said tank portion in an inner portion so as to maintain said inner portion in an airtight state; and an air pressure balancing portion (170) configured to be provided in said casing and balance an air pressure between inner and outer sides of said casing.

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9. The fuel tank for the fuel cell according to claim 2, wherein said fuel valve is constituted by an electromagnetic valve (180) which opens and closes the flow path on a basis of an electric signal.

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10. A fuel cell system comprising:

a fuel tank (101-105) for a fuel cell, the fuel tank accommodating a liquid fuel (109) supplied to a fuel cell main body (201-205), and being detachable with respect to

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said fuel cell main body, wherein said fuel tank comprises a fuel injecting portion (130) configured to be engaged with a fuel supply portion (214, 215) included in said fuel cell main body and inject said liquid fuel accommodated in said fuel tank of the fuel cell, and a flow path opening and closing member (131, 160, 139, 180) configured to be provided in said fuel injecting portion, allow said liquid fuel to pass to said fuel supply portion from said fuel injecting portion after a joint between said fuel supply portion and said fuel injecting portion in connection with a connection of said fuel tank for the fuel cell to said fuel cell main body, and shut off the passage of said liquid fuel to said fuel supply portion from said fuel injecting portion before a disconnection between said fuel supply portion and said fuel injecting portion in connection with a disconnection of said fuel tank for the fuel cell from said fuel cell main body; and

a fuel cell main body (201, 202, 203) configured to be detachable with respect to said fuel tank for the fuel cell and configured to have a fuel supply portion (214, 215) engaging with said fuel injecting portion of said fuel tank for the fuel cell and a power generating portion (220) generating an electric power by said supplied liquid fuel.

11. The fuel cell system according to claim 10, wherein

said flow path opening and closing member included in said fuel tank for the fuel cell is constituted by at least one of a fuel valve (131, 160, 180) provided in a flow path of said liquid fuel and an injecting portion side closing valve (139), and in a case that said fuel tank for the fuel cell has said injecting portion side closing valve, said fuel supply portion provided in said fuel cell main body has a supply portion side closing valve (2141) which is brought into contact with said injecting portion side closing valve so as to open and close the flow path.

12. The fuel cell system according to claim 10, wherein said fuel cell main body further has a valve opening and closing member (213, 216, 250) configured to act on a handle (132) opening and closing a liquid fuel flow path of a fuel valve (131) which is included in said fuel tank for the fuel cell and constitutes said flow path opening and closing member in accordance with an attachment and detachment between said fuel cell main body and said fuel tank for the fuel cell,

wherein said valve opening and closing member is constituted by a rod-shaped member having such a length as to open said liquid fuel flow path with respect to said handle after said fuel injecting portion and said fuel supply portion are joined, and close said liquid fuel flow

path with respect to said handle before said fuel injecting portion and said fuel supply portion are disconnected.

13. The fuel cell system according to claim 10, wherein a
5 fuel valve (160) constituting said flow path opening and closing member has a member (1621) for rotation configured to correspond to a handle in which the liquid fuel flow path of said fuel valve is opened and closed by an opening and closing mechanism (260) provided in said fuel supply
10 portion in said fuel cell main body and configured to engage with said opening and closing mechanism, and an engagement portion (161) configured to move said opening and closing mechanism engaging with said member for rotation in accordance with the attachment and detachment
15 between said fuel cell main body and said fuel tank for the fuel cell, and

wherein said opening and closing mechanism has a ring member (261) which is rotatable with respect to said fuel supply portion; a connection member (262) configured to be
20 provided in said ring member, be engaged with said engagement portion at a time when said fuel supply portion and said fuel injecting portion are joined, and rotate said ring member in accordance with the attachment and detachment between said fuel cell main body and said fuel
25 tank for the fuel cell; and a valve rotating member (263)

configured to be provided in said ring member, be engaged with said member for rotation after said connection member and said engagement portion are engaged, and move said member for rotation in accordance with a rotation of said ring member so as to open and close said fuel valve.

14. The fuel cell system according to claim 10, further comprising a lock mechanism (280) configured to lock said tank for the fuel cell to said fuel cell main body at a time when said tank for the fuel cell is installed to said fuel cell main body in a state in which said liquid fuel can be supplied to said fuel cell main body from said tank for the fuel cell.

15. The fuel cell system according to claim 10, wherein said fuel tank for the fuel cell further comprises a tank portion (120) configured to be connected to said fuel injecting portion, accommodate said liquid fuel and be made of a material deformable in accordance with a reduction of the contents; a casing (110) configured to accommodate said tank portion in an inner portion and maintain said inner portion in an airtight state; and an air pressure balancing portion (170) configured to be provided in said casing and balance an air pressure between inner and outer sides of said casing, and

wherein said fuel cell main body further comprises an engagement mechanism (175) configured to be engaged with said air pressure balancing portion and balance the air pressure between the inner and outer sides of said casing at a time when said tank for the fuel cell is installed to said fuel cell main body.

16. The fuel cell system according to claim 10, wherein said flow path opening and closing member included in said fuel tank for the fuel cell is constituted by an electromagnetic valve (180) for opening and closing the flow path on the basis of an electric signal, and

wherein said fuel cell main body further comprises a lock mechanism (285) configured to detect a matter that said tank for the fuel cell is installed to said fuel cell main body in a state in which said liquid fuel can be supplied to said fuel cell main body from said tank for the fuel cell, and a control portion (235) configured to open and close said electromagnetic valve in response to a result of detection by said lock mechanism.